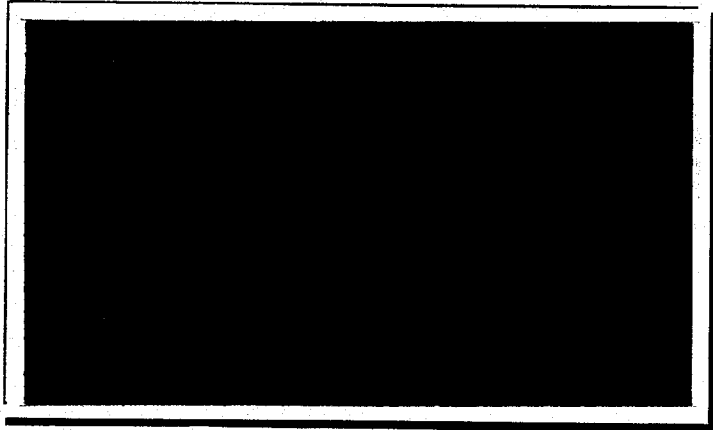


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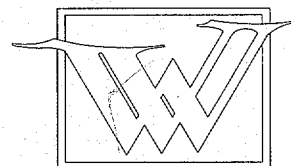
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OCZM GRANT #NA-80-AA-H-CZ157
SUBTASK 3D-10.2
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WILLIAMS & WORKS
ENGINEERS/PLANNERS/ARCHITECTS
GRAND RAPIDS, MICHIGAN 49506



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FRANKFORT COASTAL ZONE
MANAGEMENT PLAN

DATA BASE AND ANALYSIS

PART I

U. S. DEPARTMENT OF COMMERCE NOAA
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through financial assistance provided by
the Coastal Zone Management Act of 1972
administered by the Office of Coastal Zone Management
National Oceanic and Atmospheric Administration

PREPARED FOR:

The City of Frankfort
412 Main Street
Frankfort, Michigan 49635 .

PREPARED BY:

Williams & Works
611 Cascade West Parkway SE
Grand Rapids, Michigan 49506

1981

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DATA BASE

INTRODUCTION

The Data Base for the Frankfort Coastal Zone Management Plan is organized into three sections: general setting, economic conditions, and recreation/tourism conditions. The coastal park site inventory provides more specific information on man-made elements, natural elements, and perceptual characteristics.

GENERAL INFORMATION

1. Regional Location

The City of Frankfort (approximate latitude 44°38' and longitude 86°15'), Benzie County, Michigan, is located on Lake Michigan. It is situated approximately 200 miles from Chicago, 220 miles from Detroit, and 150 miles from Sault Ste. Marie. Its regional location is shown in Figure 1.

Deep draft harbors in the Frankfort general vicinity are Manistee and Ludington, located 28 and 54 miles to the south respectively. The nearest recreational craft harbors are Arcadia, located approximately 10 miles to the south, and Leland City, 40 miles to the north.

2. County Setting

The City of Frankfort (population 1,603; 1980) and the Village of Elberta (population 556; 1980) flank Betsie Lake. Other principal communities of Benzie County are Honor (population 281; 1980), Benzonia Township (population 2,461; 1980), Thompsonville (population 258; 1980), and Beulah, the County Seat (population 454; 1980). The population of Benzie County was 11,205 in 1980.

Benzie County is the smallest of Michigan's 83 counties with 202,240 acres of land. It has over 50 lakes totaling about 24,000 acres of water surface, the largest, Crystal Lake, is over 15 sq miles in size.

The two prominent rivers in the county are the Platte and the Betsie. The Betsie, which is over 40 miles long, is a designated Natural River.

3. Climate

Lake Michigan tends to temper the local climate. The prevailing winds are westerly.

The average growing season is 147 days and the average boating season is 120 days. Precipitation averages 30.92 inches and snowfall 66.4 inches.



Figure 1
REGIONAL LOCATION
CITY OF FRANKFORT
COASTAL ZONE MANAGEMENT PLAN



Detailed weather data for Frankfort are not available. The U.S. Department of Commerce (NOAA) has a climatolog station at Manistee, 28 miles south of Frankfort. Climatic averages are summarized in Table 1.

4. Physiography and Geomophology

Geologic Processes - Current topographical features in the Frankfort region have resulted from Ice Age events and shoreline dune formation. The Port Huron substage of the Wisconsin stage is most responsible for the region's characteristics. The region contains most features that can be caused by glaciers, including various moraines, glacial lakebeds, deltas, glacial drainage channels, outwash plains, ice-block lakes, drumlins, kettle holes, kames, kame terraces, and eskers. The shoreline dunes are an indirect effect of glaciation.

In general, Benzie County consists of large ground moraine areas, including part of the Manistee Moraine. Various other features are concentrated in the northern and western areas. Generalized geological characteristics are shown in Figure 2.

Topography - Lake Michigan and Betsie Lake, varying between 576 and 580 feet (international Great Lakes datum), are the lowest elevations in the region. The moraine hills within two miles northwest of Betsie Lake rise to about 970 feet, providing a local relief of about 400 feet. The communities of Frankfort and Elberta occupy low terraces with elevations rising to about 30 feet above lake level. Sand dunes, south of Betsie Lake and west of Elberta, rise to about 310 feet above and adjacent to Lake Michigan. High dunes are also found along the shoreline for about two miles north of Frankfort. Generalized topography for Frankfort is shown in Figure 3.

Geology - Shales of the Ellsworth and Antrim formations form the most shallow bedrock in the region. This bedrock lies at 450 to 550 feet below the land surface.

Soils - A detailed U.S. Department of Agriculture soil survey for Benize County is not available, however, general soils information is available from a variety of sources. Agricultural soils in Benzie County are primarily well-drained loams and sandy loams of the Nester-Iosco-Emmet Association. In addition, deeply drained sands of the Wexford-Emmet-Kalkaska-Rubicon Association can also be found. Soils are commonly 2 to 5 feet deep, overlying glacial deposits.

Soils in the Frankfort area generally include Eastport Sands and Croswell Loamy Sands of low fertility and rapid permeability. The potential for erosion by surface water runoff is related to the steep slopes of 12% and greater. Sandy soils of the dunes are susceptible to Boca water and wind erosion, where unprotected by vegetation. In general, the dunes are stabilized, however, some blowouts exist where the protective vegetation is broken.

TABLE 1. SUMMARY OF CLIMATIC AVERAGES FOR
FRANKFORT^a, MICHIGAN (1941-1970)

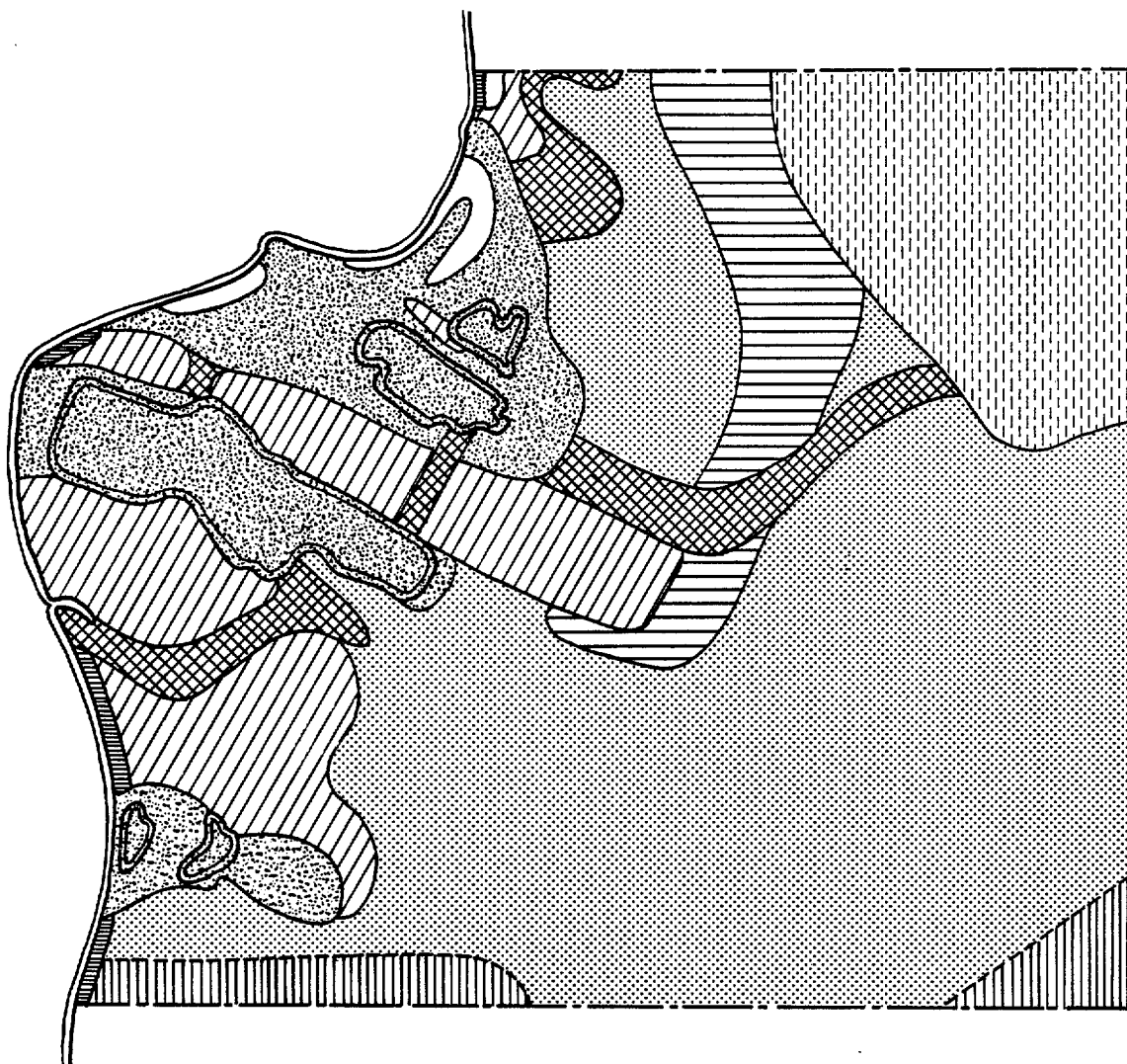
MONTH	MEAN TEMPERATURE-		PRECIPITATION-	SNOW, SLEET- ^b	
	°Fahrenheit (°Centigrade)		Inches (Centimeters)	Inches (Centimeters)	
January	23.4 (-4.8)		2.02 (5.13)	19.7 (50.0)	
February	24.1 (-4.4)		1.64 (4.17)	12.8 (32.5)	
March	31.7 (-0.2)		1.84 (4.67)	10.0 (25.4)	
April	44.3 (6.8)		2.81 (7.14)	1.7 (4.32)	
May	54.3 (12.4)		2.73 (6.93)	0.1 (0.25)	
June	64.3 (17.9)		3.01 (7.65)	0 (0)	
July	69.1 (20.6)		2.72 (6.91)	0 (0)	
August	68.4 (20.2)		2.66 (6.77)	0 (0)	
September	61.1 (16.1)		3.66 (9.30)	0 (0)	
October	51.6 (10.9)		2.74 (6.96)	0.1 (0.25)	
November	38.9 (3.8)		2.97 (7.54)	7.7 (19.6)	
December	28.3 (-2.1)		2.12 (5.38)	14.3 (36.3)	
Annual Average	46.6 (8.1)		30.92 (78.54)	66.4 (168.6)	

^aRecorded at Manistee, Michigan

^bPeriod of Record: 1927-1956

Source: U.S. Department of Commerce, NOAA

LAKE MICHIGAN



- LEGEND -

-  LOWLAND DUNES
-  PERCHED DUNES
-  EMBAYMENTS
-  END AND INTERLOBATE MORAINES
-  MANISTEE MORAINES
-  GLACIAL DRAINAGE CHANNELS
-  BLUFFS
-  ICE BLOCK LAKE AREA

Figure 2
 BENZIE COUNTY
 GENERALIZED GEOLOGICAL
 CHARACTERISTICS
 CITY OF FRANKFORT
 COASTAL ZONE MANAGEMENT PLAN

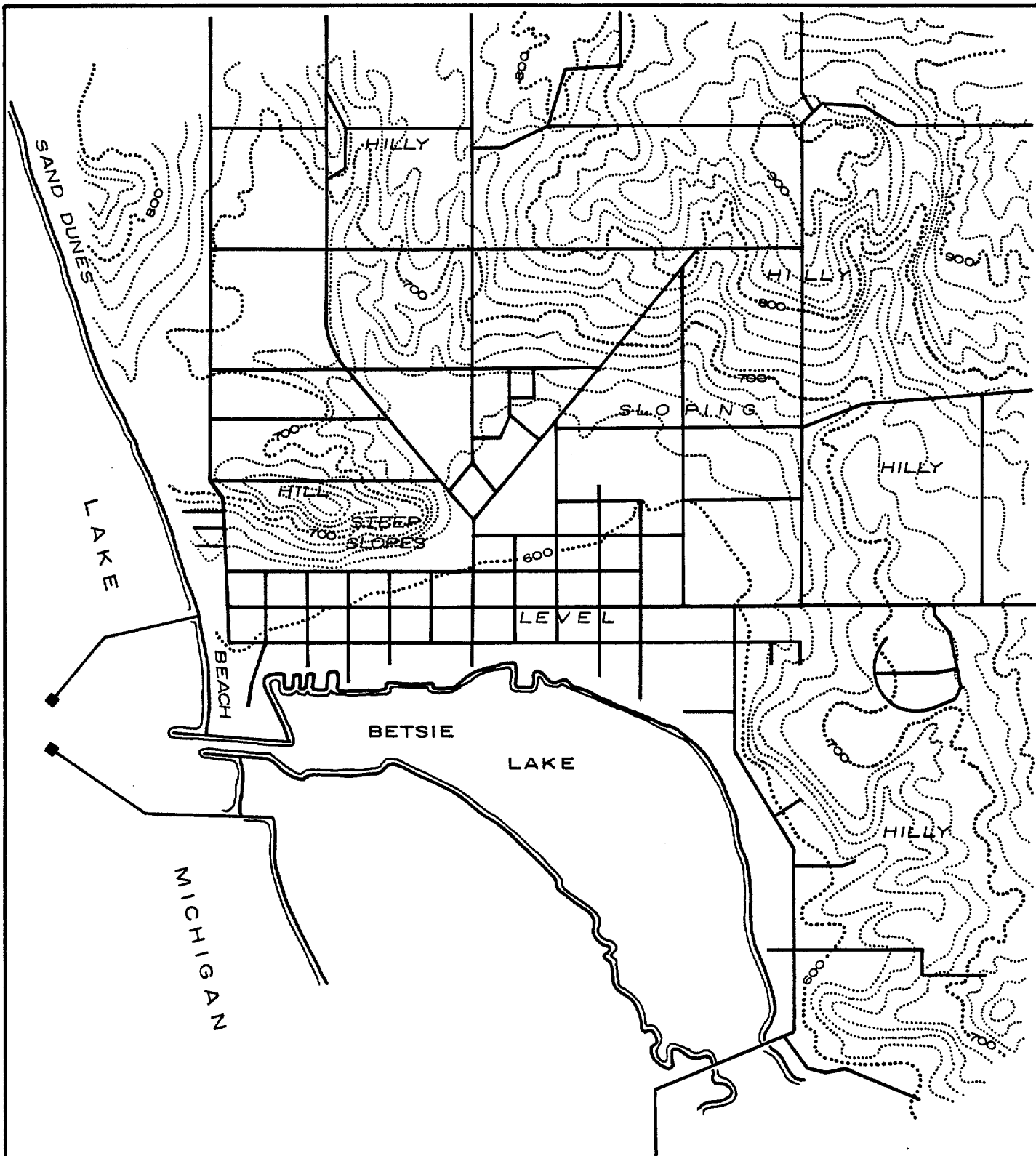


Figure 3
TOPOGRAPHY
CITY OF FRANKFORT
COASTAL ZONE MANAGEMENT PLAN

The Lake Michigan shoreline has a white sand beach which is desirable for recreation. The Lake Betsie shoreline has disturbed and man-made soils in places. Soils interpretations for the Frankfort coastal area are shown in Figure 4.

Lake Hydrology - Water levels in Betsie Lake are controlled by the Lake Michigan level and inflow from the Betsie River. The Betsie River is a small shallow stream. It drains about 260 square miles, over a length of 40 miles. It has about 33 miles of tributaries. Betsie Lake, which forms the Frankfort-Elberta Harbor, is about 1 1/2 miles long and varies from 1,000 to 2,000 feet wide.

The Lake Michigan level varies from year to year. In general, the level has a seasonal rise and fall of about 1.2 feet. The lowest levels are usually during the winter months. The highest levels are usually during the summer months.

There are also irregular variations in the lake level caused by storms and seiches. These fluctuations may attain a 1.8 foot rise in the lake level.

Lake Michigan elevations are referred to the mean water level at Father Point Quebec (International Great Lakes Datum, 1955). Low water datum for Lake Michigan is referenced at 576.8 feet. Lake levels have been declining since 1974.

Currents - There are no known studies of the Betsie Lake currents. The most likely producer of significant currents is the Betsie River. There are also wind drift currents generated within Betsie Lake. Lake Michigan seiches may produce currents of short duration.

The net flow of water, due to the Betsie River, is northward and westward into Lake Michigan. The movement of the water is slow. The features of the Betsie Lake shoreline are not related to a significant current flow.

Lake Michigan Erosion - The Lake Michigan shoreline, north of the breakwaters, is classified as a "critical erosion area - not protected". The U.S. Army Corps of Engineers has determined that in the area 1,000 and 11,000 feet north of the breakwater, about 111,000 cubic yards of beach and bluff material is being lost annually.

Flood Hazard Area - Flood hazard areas extend from 100 to 200 feet inland from the north shore of Betsie Lake. The potential flood area is south of Main Street and west of the Shore Road. The 100-year flood level for Lake Michigan, in the vicinity of Betsie Lake is 583.8 feet.

Groundwater - Groundwater in the area is abundant. Domestic wells are easily developed and their water quality is generally excellent. An extensive aquifer underlies the entire region. The City lies on an underground drainageway.

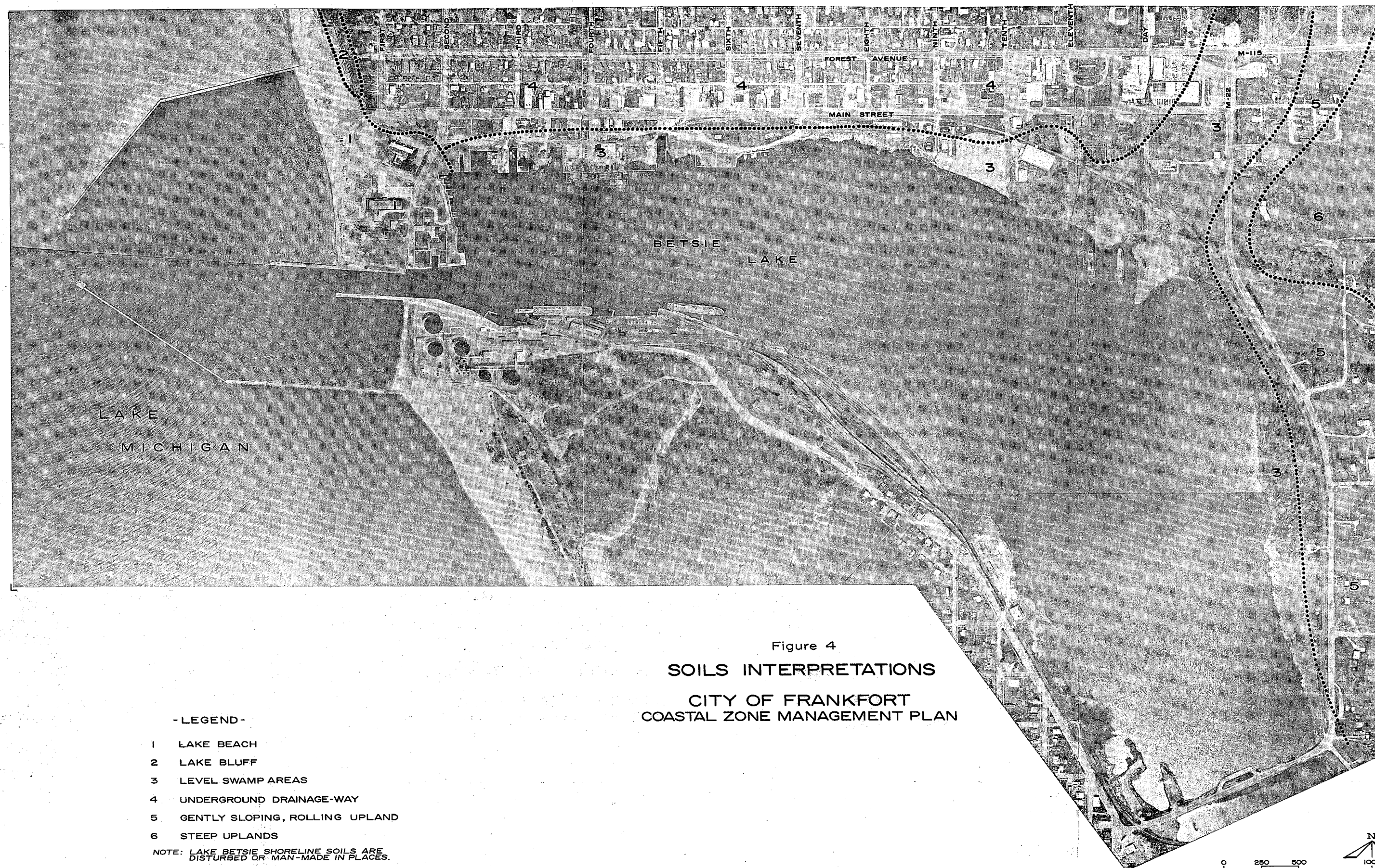
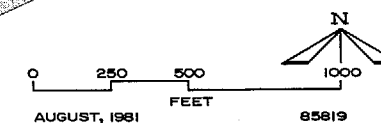


Figure 4
 SOILS INTERPRETATIONS
 CITY OF FRANKFORT
 COASTAL ZONE MANAGEMENT PLAN

- LEGEND -

- 1 LAKE BEACH
- 2 LAKE BLUFF
- 3 LEVEL SWAMP AREAS
- 4 UNDERGROUND DRAINAGE-WAY
- 5 GENTLY SLOPING, ROLLING UPLAND
- 6 STEEP UPLANDS

NOTE: LAKE BETSIE SHORELINE SOILS ARE
 DISTURBED OR MAN-MADE IN PLACES.



5. Air Quality

Detailed air quality data for the Frankfort area is not available. The U.S. EPA has classified the region with a priority III rating. This implies a relatively unpolluted condition.

6. Water Quality

Water quality throughout the Betsie River drainage basin is considered generally good. In most areas, it meets applicable standards for partial body contact.

Water quality in Betsie Lake is not as good. U.S. EPA has classified harbor sediments as polluted.

7. Vegetation

Vegetation in Benzie County, due to the diverse terrain, exhibits a wide variety of plant associations. These range from Pioneer Beach Grass to Maple-Beach Climax Forest, both of which are evident in the Frankfort area. The south-east end of Betsie Lake is swampy.

8. Fauna

Shoreline birds include sandpipers, killdeer, and plovers. Birds associated with open bodies of water include mostly diving ducks, gulls, and terns.

A total of forty species of mammals are found in the Frankfort area. Generally, these include squirrels, rabbits, skunks, racoons, rats, mice, chipmunks, moles, and deer.

The near shore area at Frankfort is a productive alewife nursery. Coho and Chinook salmon are found in offshore waters from mid-July through September. The Betsie River is a designated trout stream. Lake Trout, Brown Trout, and Steelhead Trout have been planted in the Frankfort Harbor by the Michigan Department of Natural Resources. Trout make upstream runs in September and October and after spawning, return downstream in May and June.

9. Municipal Services

Political Structure - Frankfort has a charter form of government administered by a mayor and four council members. They are elected by the City-at-large. The City also has an economic development corporation (EDC), airport-harbor commission, planning commission, and a parks and recreation commission.

Utilities - Residents of the City of Frankfort draw upon the groundwater for their potable water supply. The City operates wells to which they add sodium fluoride. The system includes mains of 2 in. through 8 in. Some hydrants are on 4 in. lines. The system needs some looping to maintain adequate pressures and fire flow. Most of the residences, commercial and industrial users are connected to the system, however, there are some private domestic wells in use.

The City of Frankfort also has about 600 sanitary sewer customers. The collection system includes some combined storm sewers, however, some separation has been accomplished. The treatment facility provides primary treatment only and discharges into Betsie Lake. It has an estimated average flow of 206,000 gallons per day.

Other utilities in the area include: electricity (Consumers Power Company), gas (Michigan Consolidated Gas Company), and telephone (Michigan Bell Telephone Company).

Zoning - The City of Frankfort has a Zoning Ordinance which has been in effect since 1976. This Zoning Ordinance provides for three classes of residential zoning, three classes of commercial zoning, one class of industrial zoning, and two classes of special zoning (public lands and uses, and critical environmental or high risk erosion land).

The following generalized zoning map (Figure 5) shows districts near Lake Michigan and Betsie Lake. The Lake Michigan frontage is zoned CEHRE-1 (Critical Environmental or High Risk Erosion). This district permits public park uses, single-family residential uses and certain special uses. Shoreline development must have a 200-foot setback in this district.

Just inland from the CEHRE-1 area, the Lake Michigan shoreline is zoned R-1B (Medium Density Residential). This district permits single-family, two-family, and certain planned unit developments.

The Betsie Lake shoreline, from the inlet to Tenth Street is zoned P-1 (Public Lands) and C-3 (Commercial Water Front). In the public lands district, recreation, open space, and governmental facilities are permitted. In the C-3 district, all uses are subject to special use approval. The uses enumerated are water/retail oriented such as: marinas, restaurants, motels, and retail specialty shops.

The Betsie Lake shoreline from Tenth Street to Lake Street is zoned L-1 (Limited Light Industrial). This district is intended to accommodate industrial, warehousing, heavy commercial, and manufacturing uses. It is also intended to buffer such uses from single family residential areas.

The remainder of the Betsie Lake shoreline is zoned R-1A (Single-Family Residential). This district is intended for single-family residential development without public water and sewer. In addition, certain educational, religious, and public uses may be permitted by special use approval.

10. Existing Land Use

The pattern of existing land use fits well with the zoning. Generalized land use (Figure 6) is shown on the following map.

Much of the existing development along Betsie Lake either ignores the waterfront or is unrelated to it. Many of the stores have only service entrances and storage on the water front side. In any other community, such property would be highly coveted.

Most of the industries have room to grow. Other uses (e.g. Luedtke's construction equipment and the city's garage) conflict with the dominated commercial land use pattern.

11. Harbor Facilities

An outer basin, formed by arrowhead breakwaters, protects the channel connecting Lake Michigan and Betsie Lake. The breakwaters are 450 ft apart at the outer ends (harbor mouth). The north arm is 1972 feet long and the south arm is 2588 feet long. The entrance channel is 1078 feet long on the north and 891 feet long on the south.

The U.S. Army Corps of Engineers maintains depths of 24 feet at the harbor mouth, 20-23 feet within the breakwaters, 22 feet in the entrance channel, 18 feet in Betsie Lake (to Sixth Street), and 10 feet in the recreational anchorage. Authorized depths are shown in Figure 7, harbor structures and channel dimensions.

In 1941, the City of Frankfort has dredged the area east of Fifth Street for recreational craft. The Michigan Waterways Commission has helped the City with the rehabilitation of the municipal docks and boat launching ramps.

In addition, it appears that a channel has been dredged to the Luedtke engineering property in the industrial area. The remainder of the lake gets increasingly shallow and becomes swampy.

Frankfort has several commercial docks, including: Carland Marine Service, Jacobson Marine, Luedtke Engineering Company, Olsen Fish Company, and the charter fishing boat docks. Elberta has the car-ferry terminals (consisting of 2-car ferry slips, a wharf, and railroad yards), Koch Fuel service, and a private marina.

All of the south shore and much of the north shore of Betsie Lake has rail service. The developed areas are served by public sewer and water. The low areas, along the north-east shore, probably will not have public sewer and water in the near future. Electricity, gas, and telephone are available throughout the area.

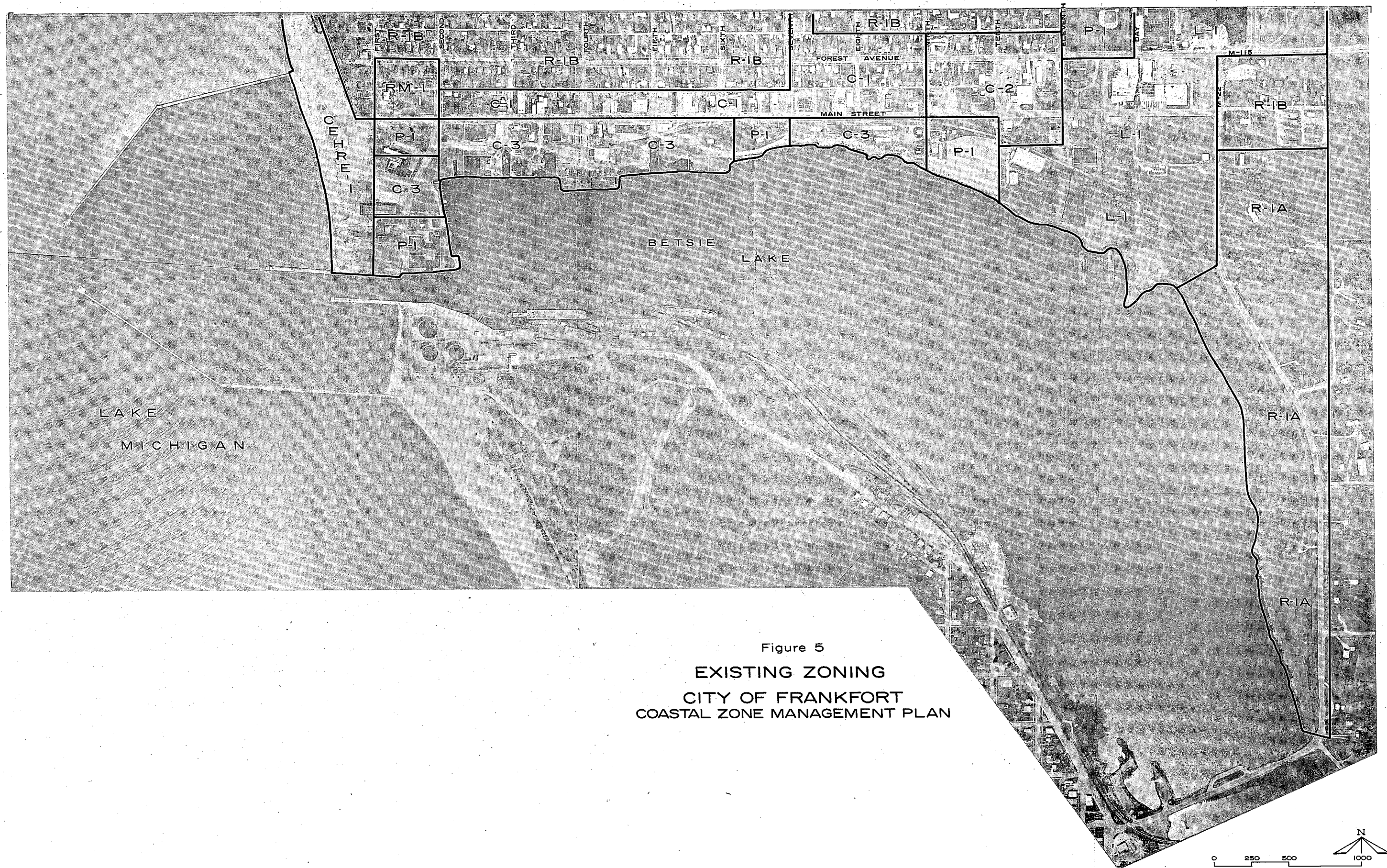
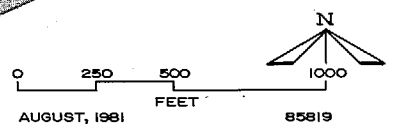


Figure 5
 EXISTING ZONING
 CITY OF FRANKFORT
 COASTAL ZONE MANAGEMENT PLAN



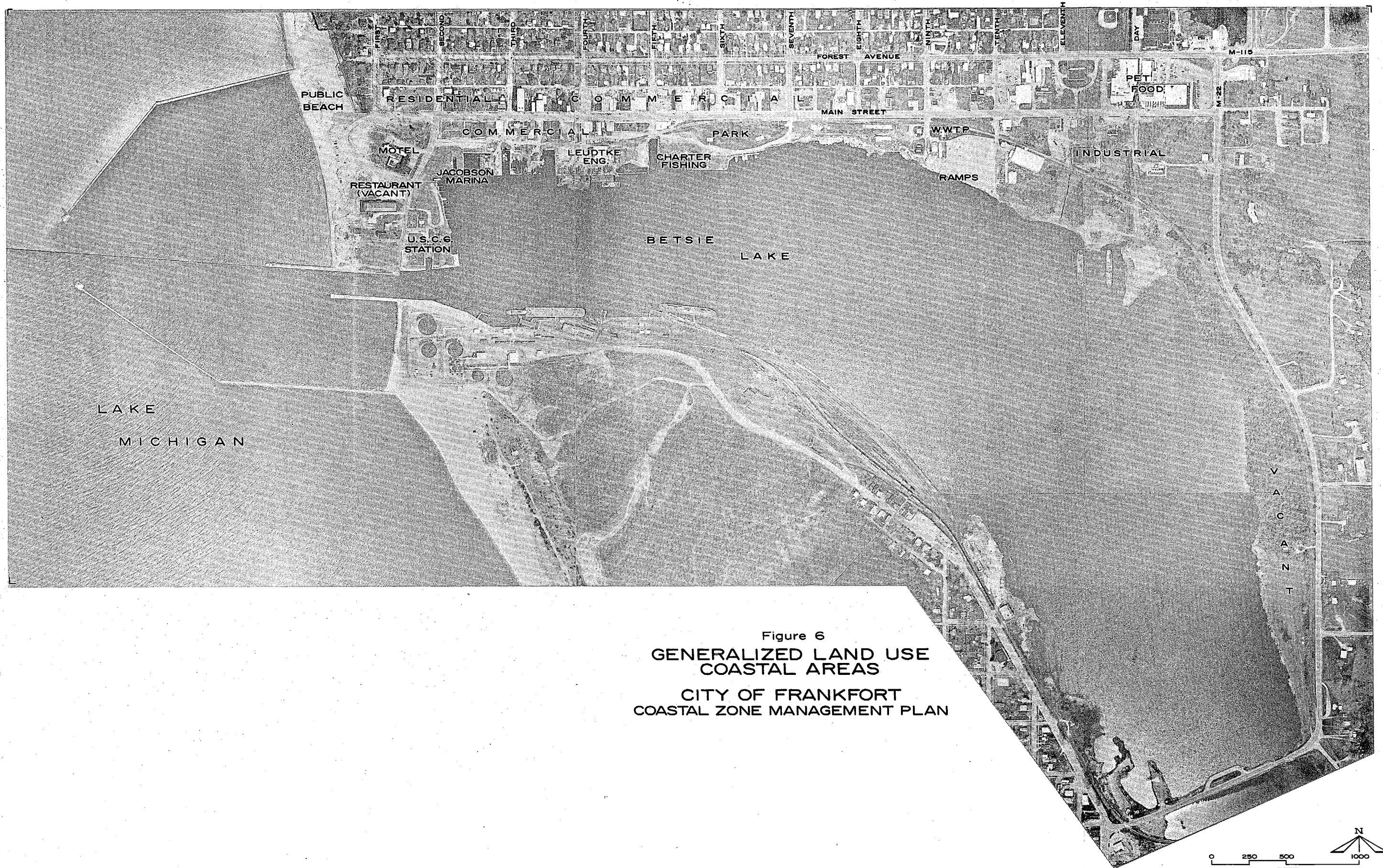


Figure 6
 GENERALIZED LAND USE
 COASTAL AREAS
 CITY OF FRANKFORT
 COASTAL ZONE MANAGEMENT PLAN

12. Population

General - The population of Benzie County peaked in the early 1900's. The population then decreased until the mid-1900's. Benzie's demographics is directly related to the area's economy.

Permanent Population - The permanent population of an area supports the primary labor force. It requires goods and services on a year-round basis. The population of Frankfort and Benzie County are shown in Table 2, permanent population.

The county population has been increasing since the 1930 low point. According to the 1980 U.S. census preliminary counts, it has now surpassed the 1910 peak.

While the county population has been rising, the Frankfort population has been decreasing. Between 1940 and 1980 there is a net decrease of 42 people, and between 1970 and 1980 Frankfort decreased by 63 people.

Various sources have attempted to project Frankfort's demographics, however, these are questionable. Frankfort's demographics will depend upon the regional economy. If the economy declines, so will the population. If the economy thrives, the population will grow.

The magnitude of change is proportional regarding the tourist and agricultural industries. A major addition/loss to the industrial economy would have a very direct impact on the population.

Age, years of schooling, and family income for Benzie County (1970) are shown in Table 3, population characteristics. This information is not yet available for the 1980 census. Table 4 shows age distribution for the City of Frankfort (1970).

Frankfort has an average density of 515 people per square mile (1980), and 3.1 people per dwelling unit (1970).

Seasonal Population - The seasonal population of a resort area is often a significant factor. Table 5 shows total population (permanent plus seasonal) for Benzie County.

August has the largest population. The total population about triples from the base (permanent) population. March has the smallest population, about 13% additional.

PERMANENT POPULATION

TABLE 2

	<u>1900</u>	<u>1910</u>	<u>1920</u>	<u>1930</u>	<u>1940</u>	<u>1950</u>	<u>1960</u>	<u>1970</u>	<u>1980</u>
Benzie County	9,685	10,638	6,947	6,587	7,800	8,306	7,834	8,593	11,165
Frankfort	--	--	--	--	1,642	1,605	1,690	1,660	1,597

Source: Benzie County 1900-1970: Michigan Manual, 1979-1980

Frankfort 1940-1980 and Benzie County 1980: U.S.
Census of Population

TABLE 3
POPULATION CHARACTERISTICS

BENZIE COUNTY

AGE BY PERCENT OF TOTAL POPULATION	<u>1950</u>	<u>1960</u>	<u>1970</u>
Under 15 years	30.2	31.8	29.5
15-24 years	14.3	13.0	13.2
25-39 years	17.2	15.0	15.5
40-64 years	27.7	27.6	27.5
65+ years	10.6	12.6	14.3
YEARS OF SCHOOL COMPLETED BY PERSONS OVER 25 YEARS BY PERCENT OF TOTAL PERSONS			
8 or under	44.4	40.4	23.8
1-3 high school	19.3	20.3	23.0
4 high school	23.7	23.5	33.5
1-3 college	8.9	10.1	10.8
4 college	3.7	5.7	8.9
Median years completed	9.4	10.4	12.1
FAMILY INCOME BY PERCENT OF TOTAL FAMILIES			
Less than \$3,000	69.0	28.3	11.6
\$3,000 - \$5,000	25.8	28.8	16.2
\$5,000 - \$7,000	3.5	24.4	16.0
\$7,000 - \$10,000	1.2	14.4	21.8
\$10,000 - \$15,000	0.3	3.5	22.3
\$15,000+		0.6	12.1
MEDIAN	2,133	4,563	7,760

SOURCE: U.S. Census of Population, 1950 - 1970

TABLE 4
AGE DISTRIBUTION (1970)

	<u>0-4 Years</u>	<u>5-14 Years</u>	<u>15-24 Years</u>	<u>25-44 Years</u>	<u>45-65 Years</u>	<u>65+ Years</u>
Frankfort	103	383	222	330	374	248

SOURCE: U.S. Census (1970)

TABLE 5
TOTAL POPULATION
BENZIE COUNTY

	<u>Permanent Residents</u>	<u>Seasonal Visitors</u>	<u>Total</u>	<u>Multiple of Growth</u>
January	11,165	2,884	14,049	1.26
February	11,165	2,204	13,369	1.20
March	11,165	1,423	12,588	1.13
April	11,165	2,093	13,258	1.19
May	11,165	5,983	17,148	1.54
June	11,165	14,553	25,718	2.30
July	11,165	19,509	30,674	2.75
August	11,165	21,873	33,038	2.96
September	11,165	4,438	15,603	1.40
October	11,165	3,485	14,650	1.31
November	11,165	2,942	14,107	1.26
December	11,165	2,257	13,422	1.20

SOURCE: Data Research Center, Inc.

13. Transportation

Transportation facilities in the Frankfort area are shown in Figure 8.

Roads and Highways - Frankfort is served by M-22 (north-south) and M-115 (east-west). M-22 is a scenic highway which also functions as a regional arterial. US-31 is the main north-south route. It is located seven miles east of Frankfort. M-115 functions as a feeder to US-31 from Frankfort.

US-31 is an arterial of statewide importance. It begins at the Indiana border and continues through to the Mackinac Bridge. In the process, it provides access to every major community along the eastern shore of Lake Michigan. The US-31 southern approach to the Sleeping Bear Dunes park is estimated to carry 30% of the park's traffic. It is estimated that M-115 (east of US-31) will feed traffic from south and central Michigan to this segment of US-31. It is estimated that 717,000 annual vehicle trips will be generated by the national park when it is fully operational, of which 215,000 (annual) will be by the US-31 southern approach.

M-22 is estimated to carry less than 15% (10,755 trips annually) of the national park's traffic. This percentage could be increased if traffic improvements were made in the Frankfort area.

The lowest traffic volumes occur in January and February at about 60% of the average daily traffic. July and August are the peak months when average daily traffic can double.

Water Borne - The Frankfort-Elberta Harbor is the only port for large ships or barges in the county. Nearby deep draft harbors include: Manistee (28 miles south), Ludington (54 miles south), Charlevoix (75 miles north), and Traverse City (92 miles north); as measured by nautical routes.

The Frankfort-Elberta Harbor is home port for the car-ferry, Koch Fuels, Luedtke Engineering and Construction, and a number of charter fishing boats. At the present, the future of the car-ferry (and the future tug-barges) is unsettled.

Railroad - Two railroad lines traverse Benzie County. The C&O railroad serves the western coastal areas of Michigan - Petoskey to Chicago, Illinois. The Ann Arbor railroad provides service from Toledo, Ohio through Frankfort/Elberta (via the car-ferry) to Manitowoc, Wisconsin.

Little of the tonnage shipped on these lines comes from, or is destined for, points in Benzie County. Inbound construction materials and outbound agricultural products (fruit) make up the bulk of the tonnage with an origin/destination in the County.

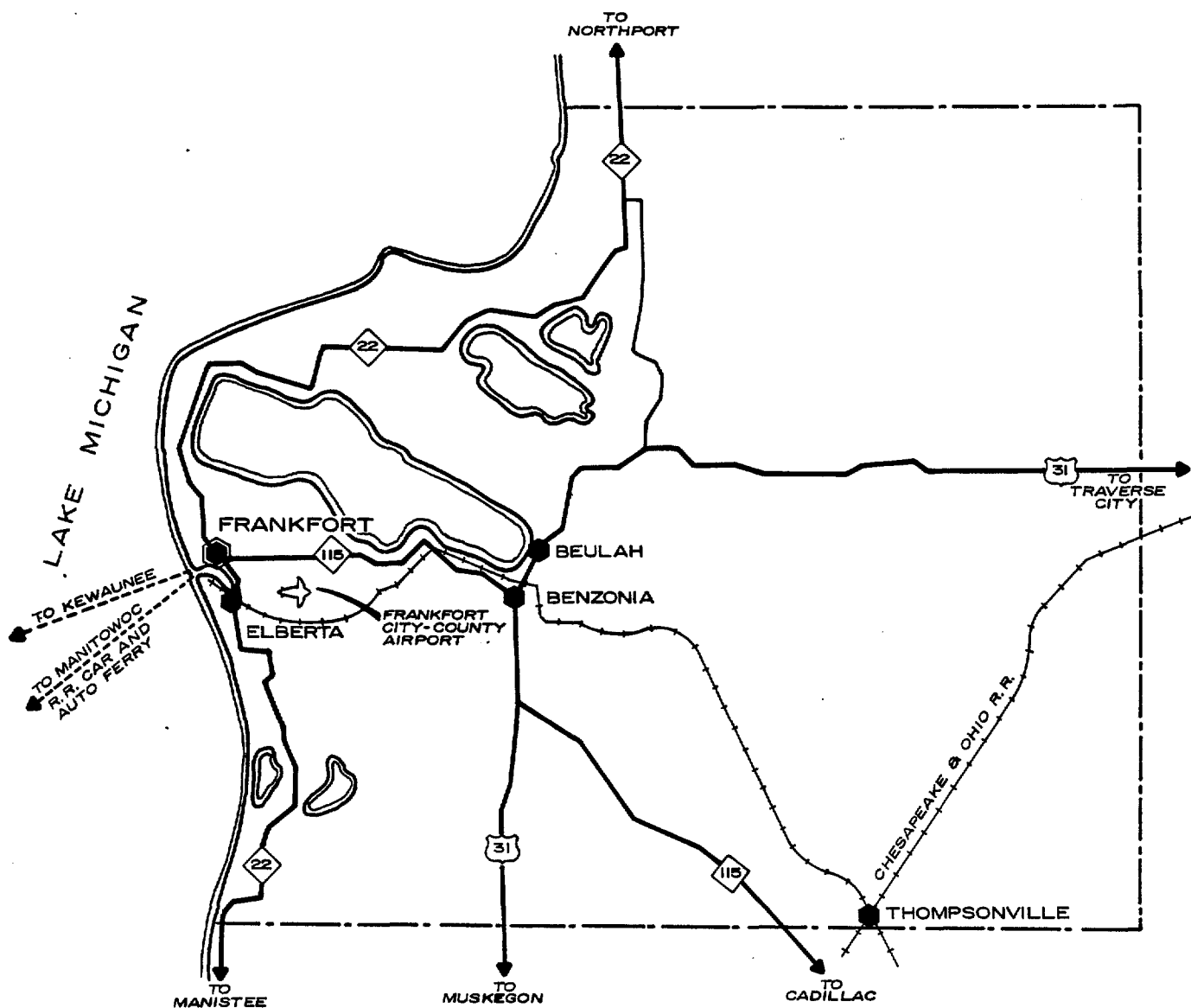


Figure 8
 TRANSPORTATION
 FACILITIES
 CITY OF FRANKFORT
 COASTAL ZONE MANAGEMENT PLAN

Air - The Cherry Capital Airport (Traverse City) provides commercial air passenger and shipping transportation for Benzie County. This airport offers charter service and regularly scheduled interstate/intrastate service. The Cherry Capital Airport is capable of handling the smaller commercial jet aircraft.

The Frankfort City-County Airport is a general aviation facility. It is capable of handling only small private aircraft. The Frankfort Airport is a popular destination for tourists and vacationers.

ECONOMIC CONDITIONS

INTRODUCTION

The timber industry was the most important element of the local economy until the end of the 19th century when the forests were depleted. The economy then switched to wholesale/retail trade, dairying, and fruit growing. The Frankfort area has a long history of tourism, with the early vacationers coming by ship from Chicago. Fishing was an early industry, however, the sea lamprey reduced the available quantity of fish in the 1950's. As a result, nine Frankfort fishing companies went out of business. Today Frankfort's economy is tourism, agricultural products, transportation, and industry. The U.S. Census 1970 reports that manufacturing, retail trade, and services employ 20.9, 17.3, and 28.7 percent, respectively, of the Benzie County labor force. Agriculture and transportation have declined since 1950, yet still are a noteworthy component of the employment picture. In 1970, 7.1 percent of the labor force was employed in agriculture and 7.0 percent was employed in transportation. (See Table 6, Employment by Industry).

The 1977 Census of Business Information is presented in Table 7, Employees and Establishments by Industry.

1. Manufacturing

In 1970 and 1960, about 20% of the Benzie County labor force was employed in manufacturing. In 1950, about 8% was employed in manufacturing. The size of the manufacturing component has kept pace with county population growth. There has been a shift in the type of manufacturing from furniture to food products. There has also been employment growth in the manufacture of electrical machinery, equipment, and supplies and the manufacture of textiles and textile products. Employment by industry is shown in Table 8.

The 1977 Census of Business reports some growth in industries employment, from 596 (1970) to 615 (1977).

The Frankfort-Elberta area supports several industrial, including:

Pet Milk Company	Frozen food
Frankfort Garment Company	Women's garments
Frankfort Manufacturing Company (Div. of Allied Products)	Cold-heading tools and machined parts
Pheoll Manufacturing Company (Div. of Allied Products)	Fasteners for electronics
Allied Products Corporation	Cabinet doors
Production Industries	Conveyor chains
H.W. Jencks, Inc.	Electrical coils
Elberta Packing Company	Fruit packing and processing
Smeltzer Orchard Company	Fruit packing and processing
Luedtke Engineering Company	Marine construction

TABLE 6
EMPLOYMENT BY INDUSTRY
BENZIE COUNTY

<u>INDUSTRIAL CATEGORY</u>	<u>PERCENT OF TOTAL EMPLOYMENT</u>		
	<u>1950</u>	<u>1960</u>	<u>1970</u>
Agriculture, Forestry, and Fisheries	20.5	10.4	7.1
Mining	.2	--	--
Construction	8.3	6.4	9.4
Manufacturing	8.3	20.3	20.9
Transportation, Communications, Utilities	14.2	15.9	7.0
Wholesale Trade	20.0	1.1	3.3
Retail Trade	6.6	15.9	17.3
Food and dairy products stores	1.4	4.1	1.0
Eating and drinking places	3.1	2.4	2.3
Other retail trade	2.1	9.4	14.0
Finance, Insurance, and Real Estate	7.1	1.8	3.1
Services	18.3	23.0	28.7
Business services	2.0	.2	.1
Repair services	.2	1.3	1.8
Private households	2.1	3.3	1.0
Other personal services	2.1	3.1	4.0
Entertainment and recreation	1.0	.8	.6
Hospitals	1.7	4.1	5.4
Education services	5.0	6.7	10.5
Welfare and religious	--	1.3	1.1
Other professional services	.7	2.2	4.2
Public Administration	3.5	3.5	3.2
Not Reporting	1.2	1.8	--

SOURCE: U.S. CENSUS 1950, 1960, 1970

TABLE 7
EMPLOYEES AND ESTABLISHMENTS BY INDUSTRY
BENZIE COUNTY, 1977

<u>INDUSTRIAL CATEGORY</u>	<u>NUMBER OF EMPLOYEES</u>	<u>NUMBER OF ESTABLISHMENTS</u>
Agricultural services, forestry, fisheries construction	0-19*	2
Construction	125	50
Manufacturing	615	19
Transportation and public utilities	20-99*	8
Wholesale trade	26	8
Retail trade	408	92
Finance, insurance, and real estate	64	14
Services	410	62
Other	0-19*	2
	<hr/>	<hr/>
Total	1,679	257

* Figures shown as ranges to avoid disclosure of individual establishment sizes.

SOURCE: U.S. CENSUS, 1977

TABLE 8
EMPLOYMENT BY MANUFACTURING INDUSTRY
BENZIE COUNTY

	<u>1950</u>	<u>1960</u>	<u>1970</u>
Furniture	219	176	57
Primary Metals	5	4	0
Fabricated Metal	29	8	43
Machinery except electrical	16	57	39
Electrical Machinery Equipment and Supplies	1	15	88
Motor Vehicles and other Transportation Equipment	11	8	21
Other Durable Goods	11	20	40
Food and Kindred Products	39	155	189
Textile Mill and other Fabricated Textile Products	20	52	89
Printing Publishing and Allied Industries	16	16	21
Chemical and Allied Products	1	0	0
Other Non-Durable Goods	4	5	9
	<hr/>	<hr/>	<hr/>
TOTAL MANUFACTURING EMPLOYMENT	373	516	596

 SOURCE: U.S. CENSUS OF POPULATION 1950, 1960, 1970

2. Retail Trade

Frankfort is within the Traverse City region of influence. Traverse City's retail trade area is estimated to include most of northwest Michigan, west of I-75 and north of Manistee/Cadillac.

Locally, Frankfort is also competing with Beulah, Benzonia, and Honor in basic retail trade. Much of Frankfort's retail trade serves the only immediate Frankfort area or is tourist oriented. Many of Frankfort's stores close during the off-season.

Recreation and tourist trade are important economic components of the Frankfort economy. The data research center estimates that the average daily spending is \$35.00 per visitor (Beach Survey, 1978). Their 10-county average for tourist spending is shown in Table 9.

TABLE 9
TOURIST SPENDING
1978

<u>Food</u> - Grocery stores, bakeries, eating and drinking places	53.0%
<u>Lodging</u> - Hotels, motels, cabins, and campgrounds	15.4%
<u>Other</u> - Contains both services and retail trade	31.6%
TOTAL	100.0%

SOURCE: DATA RESEARCH CENTER

Seasonal visitors also contribute to the county's retail economy. Total sales in February are about 43% of those in July. While some of this may represent off-season "belt-tightening", the differential is notable. Food is a basic commodity which should not be particularly sensitive to the season. Food sales in February are about 34% of those in July. Retail sales by major category are shown in Table 10.

*Environmental and economic impact of the Sleeping Bear Dunes National Lakeshore Park, Benzie and Leelenau County Planning Commissions, August, 1973

TABLE 10
RETAIL SALES ESTIMATES
BY MAJOR CATEGORY
BENZIE COUNTY

	<u>FEBRUARY SALES</u>	<u>JULY SALES</u>
TOTAL SALES	1,228,525	2,825,125
Building Materials	141,600	244,675
General Merchandise	32,800	67,375
Food	396,800	1,159,950
Automotive	365,075	690,000
Apparel	19,475	52,650
Furniture	28,950	58,975
Miscellaneous Retail	102,400	247,025
Non-Retail	141,450	304,075

SOURCE: Wilber Smith & Associates, Base Studies: Inventories and
Analyses, Benzie County, Michigan, September, 1973.

3. Tourism

Tourism and recreation have long been an important component of Frankfort's economy. During the lake steamboat era, Frankfort was a regular port of call for tourists and summer residents. There are many recreational activities in the area to attract tourists. Since the next chapter presents this subject in detail, it will be deferred from here.

4. Agriculture

Agriculture is considered an important element of the regional economy, however, there is statistical evidence that it is on the decline in the region. Agriculture accounts for about 6% of the county's earnings in 1977. In 1950, about 20% of the labor force was employed in agriculture. In 1970, it had dropped to 7%. There was a 39% decrease in farmland between 1954 and 1969. The northwest Michigan area is a major producer of cherries for the national market. They are Benzie County's major export product. Apples and other orchard fruits are also important agricultural products in the region.

Benzie county has about 57,000 acres in saw and pole timber and about 41,000 acres in young timber.

Fruit production is important to Frankfort's economy because of the three processors in the Frankfort/Elberta area.

5. Oil and Gas

Exploration/production of oil and gas appear to be a growth industry in the region. Several sources note its virtual non-existence in the early 1970's. Between 1977 and 1978, oil production in Benzie County nearly doubled, from 28,175 barrels to 47,323 barrels per year. Gas production during the same year decreased slightly from 28,827 to 26,186 thousand cubic feet per year.

6. Labor Supply

In many areas, the existence of a labor supply and the availability of jobs are mutual requirements of population growth in the Frankfort area. There appears to be a net out-migration of persons in the working age group. There is a net in-migration in the retired age groups. The scenic and environmental quality of the region has a positive effect on the labor supply.

The Benzie County labor force (male/female) is given in Table 11, Total Labor Force. The percentage of females has increased by over 53% to about 41% of the total labor force. Some of this growth has been in traditional female areas (retail trade and services), however, most of the increase has been in textiles, electrical machinery, and fruit packing. The occupational structure

TABLE 11
TOTAL LABOR FORCE (14 years and older)
BENZIE COUNTY

	<u>1960</u>	<u>1970</u>	<u>PERCENT CHANGE</u>
TOTAL IN LABOR FORCE	2,797	3,221	14.3
Male	1,939	1,903	- 1.9
Percent Male	69.3	59.1	--
Female	858	1,318	53.6
Percent Female	30.5	40.9	--

 SOURCE: U.S. Census of Population 1960, 1970

TABLE 12
OCCUPATIONAL STRUCTURE: 1970 PERCENTAGES

<u>OCCUPATION</u>	<u>BENZIE COUNTY</u>	<u>MICHIGAN</u>
White Collar	35.1	44.9
Professional, technical, and kindred	11.5	14.2
Managers and administration (exc. farm)	7.5	7.0
Sales workers	5.3	6.8
Clerical and kindred	10.8	16.9
Blue Collar	40.8	40.7
Craftsmen, foremen, and kindred	15.8	15.4
Operatives (exc. transport)	16.2	17.5
Transport equipment operatives	3.4	3.8
Laborers (exc. farms)	5.4	4.0
Farm	6.3	1.5
Farmers and farm managers	3.0	1.0
Farm laborers and farm foremen	3.3	0.5
Service	17.8	12.9
Service workers	16.8	11.9
Private household workers	1.0	1.0

 SOURCE: U.S. Bureau of the Census. Census of Population: 1970.

of the labor force for Benzie County and the State of Michigan is given in Table 12. The percentage of farm workers is well above the state average, however, the percentage of white collar workers is a little below the state average.

The labor force in Benzie County peaks toward the end of the summer. This work force depends upon the availability of student workers and seasonal workers. Peak employment for agriculture is May through October. Fruit processing usually begins in July and ends in December. Thus the mid-winter period of January through April has the lowest employment.

The Data Research Center, Inc. conducted a community life survey in 1978, in which they determined commuting patterns for Benzie County. About 74% of the labor force remains in Benzie County. The remainder commutes to Grand Traverse County (21%), Manistee County (3%), and other counties (1%). Only Leelanau and Manistee send commuters to Benzie County (3.8% and 2.0% respectively). No other nearby counties have any significant number of commuters coming into Benzie County.

Unemployment has been a persistent problem in the Frankfort area. The seasonal variations noted above compound this problem. Unemployment rates for September and mid-March are presented in Table 13. The Difference between the seasonal and the off-season is dramatic.

7. Water Borne Commerce

Commercial vessel traffic at the Port of Frankfort-Elberta is mainly the railroad car ferry. There are also a few local charter fishing boats, oil barges, and construction vessels using the harbor. Occasionally, a lake freighter or barge will call.

The car ferry traffic is generally through shipments which neither originate nor terminate in the Frankfort area. Other commercial traffic is dependent upon specific businesses such as Koch Fuels or Luedtke Engineering. Passenger traffic is carried by the car ferry.

Freight tonnage and passengers carried are shown in Table 14. Freight tonnage peaked in 1970 at 1,632,508 short tons and has been decreasing since. The 1976 freight traffic was about a fourth of the 1970 freight traffic. Passenger traffic peaked in 1971 at 29,666 and has been decreasing since. The number of passengers carried in 1976 is less than half of those carried in 1971.

Freight traffic and passengers (where applicable) for selected ports which are in competition with Frankfort are shown in Table 15. Frankfort's tonnage has been the lowest of all ports providing car ferry service. While Ludington and Muskegon had very similar traffic tonnages, Frankfort shipped about half of each of these ports. Like Frankfort, Ludington's and Muskegon's freight traffic peaked in 1970, and have been declining since.

TABLE 13
UNEMPLOYMENT RATES

BENZIE COUNTY

	<u>MARCH</u>	<u>SEPTEMBER</u>
1973	20.5	6.5
1974	13.5	7.4
1975	17.8	11.6
1976	15.7	9.1
1977	18.4	7.6
1978	13.3	5.9
1979	16.8	8.4
1980	19.2	13.4

TABLE 14
TONNAGE AND PASSENGERS BY YEAR
PORT OF FRANKFORT-ELBERTA

<u>YEAR</u>	<u>PASSENGERS</u>
1961	11,781
1962	11,005
1963	12,610
1964	20,641
1965	22,943
1966	24,216
1967	27,537
1968	26,107
1969	25,225
1970	22,577
1971	29,666
1972	21,614
1973	15,076
1974	13,021
1975	14,077
1976	13,410

SOURCE: U.S. Army Corps of Engineers

TABLE 15
TONNAGE AND PASSENGERS BY YEAR FOR SELECTED PORTS

Year	Frankfort		Traverse City		Ludington		Muskegon	
	Freight	Passengers	Freight	Passengers	Freight	Passengers	Freight	Passengers
1967	1,528,805	27,537	204,353	-0-	3,836,254	170,083	3,606,906	95,415
1968	1,597,619	26,107	198,840	-0-	3,639,093	182,228	3,765,652	101,034
1969	1,614,480	25,225	288,325	-0-	3,664,748	174,224	3,402,747	101,096
1970	1,632,508	22,577	286,711	-0-	4,664,748	177,353	3,554,628	111,594
1971	1,563,448	29,666	308,475	-0-	4,258,442	205,389	3,541,910	742
1972	1,353,101	21,614	446,244	-0-	3,368,015	176,598	2,835,823	-0-
1973	1,176,446	15,076	422,447	-0-	2,541,739	179,055	2,922,730	-0-
1974	801,645	13,021	405,158	-0-	2,178,835	188,426	2,508,138	-0-
1975	644,659	14,077	364,777	-0-	2,123,507	149,251	1,945,311	-0-
1976	433,067	13,410	398,277	-0-	2,338,774	156,218	2,270,826	-0-

FREIGHT GIVEN IN SHORT TONS

SOURCE: U.S. Army Corps of Engineers

Passenger traffic is similar. In 1967, Ludington's passenger traffic was about six times that of Frankfort. By 1976, it had increased to about twelve times Frankfort's. Until it was discontinued, Muskegon also had more passenger traffic.

The discontinuence of the Muskegon passenger traffic caused a temporary increase in passenger traffic at the other ports. It coincided with each port's peak passenger year.

Traverse City does not have a car ferry service. Consequently, its freight tonnages are much lower than any of the other ports. Its commodity profile is very specialized and almost entirely centered around coal, gasoline, and fuel oil. The lack of a car ferry also means that there is no passenger service.

Frankfort's commodity profile is shown in Table 16, however, most of these materials are shipped through. In 1976, the port received or shipped a total of 433,067 tons of freight, of which only 13 tons had a local origin/destination. This was all in fresh fish.

Table 17 shows the number of trips, inbound and outbound, by vessels of various drafts and types. The car ferry dominates this table with over 1,000 trips. There is also a sizable (256 trips) usage by small vessels.

CROSS-LAKE TRAFFIC FORECASTS

In 1980, Kearney Management Consultants prepared the Forecast of Cross-Lake Michigan Rail Car Ferry Traffic for the Michigan Department of Transportation. It reports an increase of total freight traffic in 1979 as a result of rate flag-outs by the Michigan Interstate Railroad (which uses the Port of Frankfort-Elberta).

Kearney's forecast of the 1985 demand for cross-lake rail service was based on six scenarios:

DESCRIPTION OF TRAFFIC FORECAST SCENARIOS

<u>Scenario Number</u>	<u>Description</u>
1	<u>Base Case - No Change - Status Quo</u> <ul style="list-style-type: none">• Service differential between cross-lake and Chicago remains the same.• Rate advantages continue for commodities presently under flag-outs (except potash).• No rate advantage for commodities not included under flag-outs.

- 2 Rate Advantage Cross-Lake - Service Improves
- Flag-outs continue on specified commodities.
 - New flag-outs on other commodities.
 - Service improves for cross-lake compared to Chicago.
- 3 No Rate Advantage Cross-Lake - Service Improves
- No flag-outs on any commodities.
 - Service improves for cross-lake compared to Chicago.
- 4 No Rate Advantage Cross-Lake - Service Same
- No flag-outs on any commodities.
 - Service differential between cross-lake and Chicago remains the same.
- 5 Service Declines - Regardless of Rates
- Deterioration in cross-lake service compared to Chicago.
- 6 Rate Advantage Cross-Lake - Service Same
- Flag-outs continue on specified commodities.
 - New flag-outs on other commodities.
 - Service differential between cross-lake and Chicago remains the same.

SOURCE: Forecast of Cross-Lake Michigan Rail Car Ferry Traffic, Final Report, Michigan Department of Transportation; Kearney Management Consultants, June, 1980, Table II-2, page II-8.

TABLE 16
COMMODITY PROFILE, PORT OF FRANKFORT-ELBERTA
1976
(SHORT TONS)

<u>COMMODITY</u>	<u>TOTAL</u>	<u>RECEIPTS</u>	<u>SHIPMENTS</u>	<u>LOCAL</u>
TOTAL	433,067	295,434	137,620	13
Field Crops	855	559	296	
Miscellaneous Farm Products	1,560	1,540	20	
Forest Products	977	86	891	
Fresh Fish, except Shellfish	13			13
Coal and Lignite	900	--	900	
Building Stone, unworked	92	36	56	
Sand, Gravel, Crushed Rock	1,086	--	1,086	
Clay	1,332	72	1,260	
Phosphate Rock	81	--	81	
Nonmetallic Minerals	8,104	1,814	6,290	
Meat, fresh, chilled, frozen	662	662	--	
Meat and Products	69	69	--	
Tallow, Animal Fats, and Oils	335	335	--	
Animal By-Products	139	139	--	
Dairy Products	2,762	2,762	--	
Vegetables and Prep	1,800	1,623	177	
Prep Fruit and Vegetable Juice	6,333	6,241	92	
Wheat Flour and Semolina	16,006	15,946	60	
Grain Mill Products	3,273	3,253	20	
Sugar	832	832	--	
Alcoholic Beverages	800	361	--	
Miscellaneous Food Products	1,402	1,125	277	
Textile Fibers	214	22	192	
Timber, Posts, Poles, Piling	186	186	--	
Pulpwood, Log	1,944	--	1,944	
Wood Chips, Staves, Moldings	1,043	1,043	--	
Lumber	35,212	35,212	--	
Veneer, Plywood, Worked Wood	18,540	18,500	--	
Wood Manufactures	2,772	2,574	198	
Furniture and Fixtures	476	414	62	
Pulp	7,941	6,886	1,055	
Standard Newsprint Paper	17,051	12,661	4,390	
Paper and Paperboard	40,978	33,461	7,517	
Pulp and Paper Products	62,845	58,200	4,645	
Sodium Hydroxide	1,881	199	1,682	
Sulphuric Acid	90	--	90	
Basic Chemical and Products	28,191	22,717	5,474	
Plastic Materials	43	--	43	

TABLE 16 (CON'T)

<u>COMMODITY</u>	<u>TOTAL</u>	<u>RECEIPTS</u>	<u>SHIPMENTS</u>
Soap	99	--	99
Paints	56	56	--
Nitrogenous Chemical Fertilizers	296	--	296
Phosphatic Chemical Fertilizers	330	--	330
Insecticides, Disinfectants	304	304	--
Miscellaneous Chemical Products	86	--	86
Gasoline	158	--	158
Distillate Fuel Oil	11,861	11,861	--
Residual Fuel Oil	13,369	6,650	6,719
Lubricating Oils and Grease	113	--	113
Asphalt, Tar, and Pitches	37,962	37,962	--
Coke, Petroleum Coke	399	--	399
Liquefied Gases	180	--	180
Asphalt Building Materials	521	38	483
Petroleum and Coal Products	493	--	493
Rubber and Miscellaneous Plastics	210	15	195
Glass and Glass Products	60	--	60
Structural Clay Products	5,055	--	5,055
Lime	25	--	25
Miscellaneous Nonmetallic Mineral Prod.	4,411	2,894	1,517
Iron and Steel Primary Forms	41	--	41
Iron, Steel Shapes	51	--	51
Iron and Steel Plates, sheets	12,859	--	12,859
Ferroalloys	1,047	211	836
Iron and Steel Products	24,934	25	24,909
Nonferrous Metals	260	260	--
Lead and Zinc, unworked	2,760	2,760	--
Aluminum and Alloys, unworked	241	241	--
Fabricated Metal Products	4,165	483	3,682
Machinery, except electrical	1,332	127	1,205
Electrical Machinery and Equipment	751	726	25
Motor Vehicles, Parts, Equipment	13,624	12	13,612
Misc. Manufactured Products	308	180	128
Iron and Steel Scrap	629	629	--
Nonferrous Metal Scrap	287	287	--
Textile Waste, Scrap, Sweep	137	137	--
Paper Waste and Scrap	24,701	29	24,672
Waste and Scrap	17	17	--
Commodities	115	--	115

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SOURCE: U.S. Army Corps of Engineers

TABLE 17
TRIPS BY DRAFT AND TYPE
PORT OF FRANKFORT-ELBERTA 1976

VESSEL DRAFT (FEET) (INBOUND)	Passenger and Dry Cargo	Tanker	Towboat or Tugboat	Dry Cargo	Tanker	TOTAL
	SELF PROPELLED VESSLES			NON-SELF PROPELLED		
19		3				3
18		1			2	3
17	514					514
13			5			5
12 or less	118		4		4	126
TOTAL	<u>632</u>	<u>4</u>	<u>9</u>		<u>6</u>	<u>651</u>
<u>(OUTBOUND)</u>						
18					1	1
17	514					514
13		1	5			6
12 or less	118	3	4		5	130
TOTAL	<u>632</u>	<u>4</u>	<u>9</u>		<u>6</u>	<u>651</u>

Kearney's Forecasts of 1985 eastbound and westbound traffic are presented as Tables 18 and 19 respectively.

The most favorable scenario (No. 2) forecasts a 60% increase (62,433 total carloads) in traffic between 1979 and 1985. The least favorable scenario (No. 5) forecasts a 50% decrease (16,145 total carloads) in traffic between 1979 and 1985. The "no-change" scenario (No. 1) forecasts an 8% increase (42,355 total carloads) in traffic between 1979 and 1985. The Kearney Forecast aggregates all traffic between the Ports of Frankfort and Ludington, Michigan and the Ports of Manitowoc and Kewaunee, Wisconsin.

An approximation of the division of this traffic between the Ports of Frankfort and Ludington may be derived based upon historical tonnages shipped by these ports. Based upon a 10-year average (1967-1976), Frankfort ships/receives 26.4% and Ludington ships/receives 73.6% of the total cross-lake Michigan traffic (see Table 20). This approximation assumes that the traffic which used the Port of Muskegon was divided equally between Frankfort and Ludington or was lost to the Chicago route.

The application of these percentages to the Kearney Forecast for 1985 is shown in Table 21. The most favorable scenario (No. 2) forecasts 16,482 carloads shipped/received by Frankfort. The least favorable scenario (No. 5) forecasts 4,262 carloads shipped/received by Frankfort. The "no-change" scenario (No. 1) forecasts 11,182 carloads shipped/received by Frankfort.

TABLE 18

FORECASTS OF FUTURE EASTBOUND TRAFFIC PROJECTED TO 1985*

(CARLOADS)

Geographic/Commodity Category	Future Scenario Number						Historical Traffic Levels	
	1	2	3	4	5	6	1978	1979
1. GBW Related Paper	12,120	16,475	10,420	8,390	5,300	12,120	7,066	8,470
2. GBW Related Food Products	1,296	1,724	1,420	1,088	579	1,296	541	925
3. GBW Related Machinery, Fabricated Metal Products, and Stone	1,500	2,500	2,100	1,500	650	1,600	247	720
4. Manitowoc Service Dependent Paper	1,485	2,440	2,054	1,485	0	1,715	56	374
5. Manitowoc Service Dependent Food and Farm Products	542	614	493	496	316	603	458	493
6. Manitowoc Service Dependent Manufactured and Fabricated Metal Products	753	1,225	975	753	300	895	412	480
7. Minnesota Food and Feed Grains	2,045	4,615	2,470	1,420	300	2,800	1,094	2,868
8. Minnesota Manufactured Goods	554	1,043	939	618	260	764	32	575
9. Minnesota Paper	675	800	425	150	50	675	431	500
10. Minnesota Lumber and Wood Products	783	1,320	1,270	783	70	783	297	783
11. Canadian Potash	1,000	5,900	1,150	920	0	4,250	276	4,093
12. Western Clay	1,300	1,600	260	260	0	1,300	35	816
13. Western Lumber	200	200	0	0	0	200	2,069	2,353
14. Western Food Products	1,000	1,200	725	725	300	1,000	542	760
15. Miscellaneous Commodities	1,430	1,340	1,340	1,340	670	1,340	1,650	1,340
TOTAL EASTBOUND CROSS-LAKE VOLUME	26,593	42,996	26,041	19,928	8,795	31,341	15,206	25,550

NOTE: * Forecast data, as well as historical traffic levels, relate to only those movements between Kewaunee and Manitowoc, Wisconsin, and Frankfort and Ludington, Michigan.

TABLE 19
FORECASTS OF FUTURE WESTBOUND TRAFFIC PROJECTED TO 1985*
(CARLOADS)

<u>Geographic/Commodity Category</u>	<u>Future Scenario Number</u>						<u>Historical Traffic Levels</u>	
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>1978</u>	<u>1979</u>
1. Michigan Paper Products	3,900	4,400	4,400	3,900	1,700	3,900	1,738	3,330
2. Michigan Chemicals	6,800	7,300	7,300	6,800	3,650	6,800	4,504	6,619
3. Autos and Auto Parts	1,150	1,500	1,300	1,150	400	1,150	1,227	732
4. Scrap Materials	1,300	1,575	975	840	375	1,300	970	600
5. Georgia Clay	1,750	3,800	2,200	1,350	800	1,750	460	1,324
6. Coal	77	77	77	77	35	77	77	77
7. Primary Metals	250	250	250	250	125	250	207	250
8. Miscellaneous Commodities	535	535	535	535	265	535	535	535
 TOTAL WESTBOUND CROSS LAKE VOLUME	 15,762	 19,437	 17,037	 14,902	 7,350	 15,762	 9,718	 13,467

NOTE: * Forecast data, as well as historical traffic levels, relate to only those movements between Kewaunee and Manitowoc, Wisconsin, and Frankfort and Ludington, Michigan.

TABLE 20
PERCENTAGE OF CROSS-LAKE FREIGHT
PORTS OF FRANKFORT AND LUDINGTON
(SHORT TONS)

	<u>Total 1967-1976</u>	<u>Average/year</u>	<u>Percent</u>
Frankfort	11,701,119	1,170,112	26.4
Ludington	32,614,155	3,261,416	73.6
TOTAL	44,315,274	4,431,527	100.0

SOURCE: Computed by Williams & Works from Table 15

TABLE 21
FORECAST OF 1985 CROSS-LAKE FREIGHT
PORTS OF FRANKFORT AND LUDINGTON
(CARLOADS)

	Percent	Future Scenario Number					
		1	2	3	4	5	6
Frankfort	26.4	11,182	16,482	11,373	9,195	4,262	12,435
Ludington	73.6	31,173	45,951	31,705	25,635	11,883	34,668
TOTAL		42,355	62,433	43,078	34,830	16,145	47,103

SOURCE: Computed by Williams & Works from Tables 18, 19, and 20

RECREATION/TOURISM

INTRODUCTION

This section inventories recreation and tourism facilities and opportunities. It includes detailed information for the park master plan, but focuses on the recreation, tourism, and seasonal vacationer component of Frankfort's economy.

Lake Michigan and Betsie Lake offer the Frankfort area with excellent recreation/tourism opportunities. The recreational boating season lasts about 120 days, from June through September. The Frankfort-Elberta Harbor is popular with weekend and seasonal boaters, as well as those traveling along the Lake Michigan shoreline.

The poor water quality in Betsie Lake limits its fishing opportunities. Likewise, the lake is not used for swimming, since it does not meet the requirements for total body contact.

Lake Michigan is popular for fishing, swimming, and boating in the Frankfort area. The lake is making a "comeback" from the barren years of the 1950's.

1. Public Facilities

Local: Parks - Frankfort has five designated municipal parks: Market Square Park, Mineral Springs Park, Rotary Park, Cannon Park, and the C.S. Kibbey Memorial Launch Facility. The city operates a marina adjacent to Mineral Springs Park. The city also maintains the Lake Michigan beach at the harbor breakwater, but it is owned by the State of Michigan.

Park facilities are described in the following matrix (Table 22). Selected photographs illustrate park features and conditions. Frankfort's parks range in condition from new or excellent to poor and needing repair.

The city marina operates at about 100% of design capacity in July and August, and at about 50% of design capacity in June and September. Most of the boats are in the 20 to 39 foot class with power boats and sailboats about evenly represented.

Schools - Through the use of joint use agreements, the sports fields, gymnasiums, and auditoriums of the Frankfort schools can be used for organized recreation. These facilities are not tourist oriented.

Museums - There are no public museums in Frankfort.

Regional: The Frankfort area offers a wealth of recreation/tourism opportunities. The facilities of regional impact are inventoried on the following page.

TABLE 22
FRANKFORT PARK FACILITIES

PARK	SIZE (acres)	FACILITIES	COMMENTS
Market Square	1.5	Tennis courts, shuffleboard, play-ground equipment	Not intended to serve tourists
Mineral Spring	6+	Playground equipment, flowing mineral spring, picnic facilities, group shelter, restrooms, charter fishing boats, marina, shuffleboard, and parking. (see marina facilities below)	There are some mature trees along Main Street, however, the landscaping is struggling in the new areas. The marina, charter fishing boat area, group shelter, and playground equipment is all new and in excellent condition. The shuffleboard courts appear to be used little. The mineral spring is in need of repair.
(City Marina)		Transient and seasonal berths (4 @ 60', 18 @ 45', and 20 @ 30'), gasoline and diesel fuel, water, electricity, restrooms (with showers), and sanitary pump out facilities.	All facilities are relatively new and in excellent condition.
Rotary	-	Open space	Functions as a part of Mineral Springs Park
Cannon	1	Picnic facilities and historic cannon.	This park is well landscaped and has some mature trees. It is in good condition. Parking is not readily available.
C.S. Kibbey Memorial Boat Launch	-	Boat launching ramps, restrooms, picnic facilities, manager's site, and parking.	Primarily a boat launching facility. It is new and in excellent condition.
Lake Michigan Beach	-	Swimming beach, playground equipment, parking	This park is owned by the State of Michigan and maintained by Frankfort. Fishing is popular from the breakwaters. There are minimal improved facilities and parking routinely becomes short. It is an excellent sand beach; however, wind erosion appears to be a problem.

Parks - In Benzie County there are about 65,250 acres of recreational/ state forest lands, 17,080 acres of lakes and streams, 36,230 acres of open space, and 60,962 acres of other forest land. There are over 23 designated public or private parks within the county, including national, state, and local parks.

The largest single park (60,748 acres planned) is the Sleeping Bear Dunes National Lakeshore. It is located along Lake Michigan in Northern Benzie County and southern Leelanau County. This park is being developed based upon the twin concepts of interpretation and recreation. The interpretation concept will be educational, focusing on the unique land forms and vegetation. The recreation concept is to provide a variety of public recreation opportunities. In general, these facilities will include: swimming, camping (modern and primitive), picnicing, snowmobiling, boating (launch and marina facilities), horse-back riding, restaurant/lodging (South Manitou Island), visitor centers, nature-hiking-bicycling trails, interpretive overlooks, and a maritime exhibit (South Manitou Island). One of the visitor centers is planned for a location on M-22 in the vicinity of Long Lake. A new park road will connect it to US31 between Beulah and Honor. A boat service to South Manitou Island is also under consideration. It would originate from the Frankfort-Elberta Harbor. The Benzie State Park has been incorporated into the National Lakeshore. Its 200 campsites are not planned for expansion by the National Park Service.

The State of Michigan maintains a variety of lands along the Betsie River. These include the Betsie River State Forest and the Betsie River Wildlife Preserve. Within the county, there are more than 58,000 acres of state forest land. Unless otherwise designated, like the Wildlife Preserve, all state forest lands are open to general recreation (hunting, fishing, and camping). There are over ninety campsites (none for R.V.'s) in these state forest lands.

The Betsie River wildlife preserve encompasses a low marshy area. It is located along the Betsie River and M-22 between Lake Betsie and Airport Road.

There are thirteen roadside picnic tables or scenic turnouts in the county. These are typically maintained by either the state Department of Transportation or the County Road Commission. The Department of Natural Resources also maintains ten public access sites (boat launches) within the county.

Environmental Management Areas - There are two environmental management areas in the Frankfort region - the Betsie River Wildlife Preserve (discussed above) and the Betsie River. The Betsie River is a state designated Natural River under P.A. 231 of 1970. Natural rivers are intended to remain free flowing and not intensively developed.

Museums - The Benzie County Historical Museum is located in Benzonia.

2. Private Facilities

Local: Marinas - There are two private marinas in the Frankfort-Elberta Harbor - Jacobson Marina and Betsie Marina. They have more than 100 slips total. Each provides a full range of marine services.

Campgrounds - There is one campground in the immediate Frankfort area. It has 85 campsites with electricity and an R.V. sanitary disposal station.

Summer Retreats/Camps - The Congregational Summer Assembly is a religious based summer community. It provides recreational services to its members.

Crystallaire Camp, a private summer camp, is located on Crystal Lake. It has 85 campsites, and offers a full range of activities, including swimming, sailing, tennis, basketball, fishing, baseball, ceramics, weaving, and silk-screening. Crystallaire also offers specialized camps such as the 1981 Crystallaire Running Camp.

Ski Areas - The Chimney Corners Ski Area is located on North Shore Road.

Golf Courses - The Frankfort Golf Club is located on M-22. It has nine holes. The Crystal Downs Country Club is located on Sutter Road. It has 18 holes, and is a private course.

Regional: Boating Facilities - There is a marina and a yacht club located on Crystal Lake. Several canoe rentals are located along the Betsie and Platte Rivers. Typically they spot and pick up the canoes and canoers. Often they also offer other boat rentals, souvenirs, hunting/fishing equipment, camping supplies, and convenience groceries.

Campgrounds - There are seven campgrounds in the Frankfort region. They provide about 360 designated campsites. They range from modern R.V. sites to primitive tenting areas. Most (321) can accommodate R.V.'s.

Summer Retreats/Camps - There are a variety of summer camps and retreats in the region. Among these is the Crystal Lake Art Center (Crystal Downs) and the National Music Camp (Interlochen).

Ski Areas - Crystal Mountain is located on M-115 in Thompsonville. It has beginner, intermediate, and expert trails (14 total), lodging, dining, and entertainment. It is operated as a year-round resort with a golf course, tennis courts, and conference facilities.

Golf Courses - The Crystal Lake Golf and Country Club is located in Beulah. It has 18 holes. Crystal Mountain (Thompsonville) also operates a golf course. It has 18 holes.

3. Activities

Frankfort and the Frankfort region offer a wide variety of recreation activities and special events. Although summer is the prime season, there are activities year round.

Recreational Activities - Water sports are particularly popular in the Frankfort area. Due to its natural assets - Lake Michigan, Betsie Lake, Crystal Lake, the Betsie River, and the Platte River - it can offer most every kind of water based activity. The Frankfort-Elberta Harbor is a designated harbor of refuge and a natural stopping point for Lake Michigan boaters. The boat launching facilities also make it popular with trailer-based boaters.

The area's lakes and rivers are popular for game fishing. Lamprey control and re-stocking has improved the fishing for steelhead trout, chinook salmon, coho, and brown trout. However, some reduced catches have been reported recently. Sport fishing off the harbor breakwaters is popular. The Betsie River is a designated trout stream.

Hunting is also popular in the Frankfort area. Common quarry are white-tail deer, ruffed grouse, woodcock, rabbits, ducks, and geese.

Many people, especially seasonal residents, enjoy the area's open space and scenic resources. They enjoy the natural diversity of the area and its natural qualities. The lakes, forests, and land forms all contribute to the visual environment. The fall "color season" is but one example.

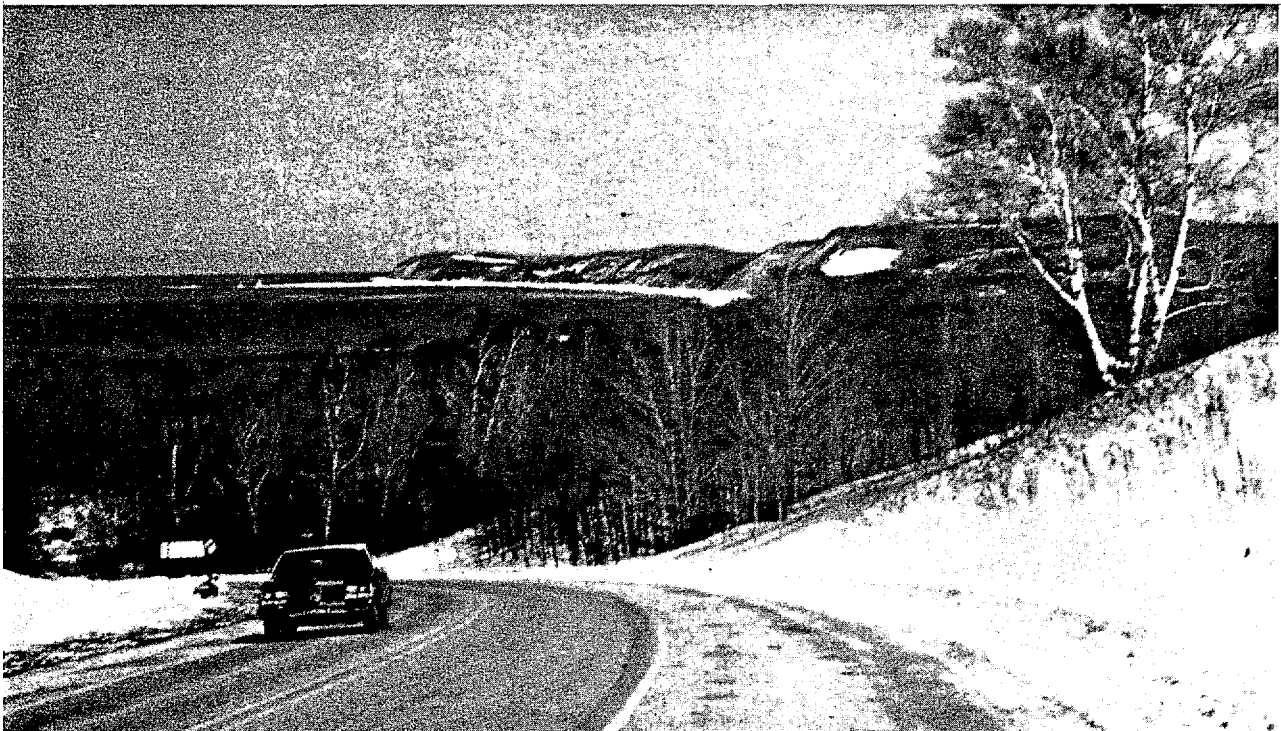


FIGURE 9: Scenic View From M-22

During the winter, skiing (cross-country and downhill), ice fishing, and snow mobiling are popular.

Special Events - Frankfort hosts the National Spring Festival each summer and a salmon fishing festival each August and September. Thompsonville hosts morel mushroom hunting each spring

4. Cultural and Historic Elements

The National Register of Historic Places does not list any districts, sites, buildings, or structures in Frankfort. One site, the Mills Community House in Benzonia, is listed in the National Register of Historic Places.

Nevertheless, the Frankfort area is rich with history. There are indian mounds located near Benzonia, and more are suspected along the Betsie River. The purported grave of Father Marquette is in Frankfort and an historic marker has been raised nearby. There is a commercial water-powered sawmill in Benzonia. The Point Betsie lighthouse is located a few miles north of Frankfort. The Michigan History Division has indicated that some of Frankfort's older neighborhoods may be eligible for designation as an historic district.

The Crystal Lake Art Center is located in Crystal Downs. Presscraft Papers, a custom printing house where visitors may watch the printing, is located in Benzonia. The National Music Camp is located in nearby Interlochen.

5. Recreation/Tourism Forecasts

Recreation and tourism are difficult to accurately forecast for a unit the size of Frankfort. Demand for this industry is influenced by several factors which are not within Frankfort's control. Since tourists do not recognize political boundaries, areawide forecasts are more meaningful.

The National Park Service estimates visitation at Sleeping Bear Dunes National Lakeshore will be 3,195,000 in 1983. They estimate its capacity is 3,869,000.

Historically, Benzie County's population about triples in August. Monthly population multipliers are given in Table 5, on page 16. The Benzie County population has been increasing, although Frankfort's population has been decreasing.

The Comprehensive Development Plan for Benzie County (Wilber Smith & Assoc. 1974) estimates a need for 470 campsites in 1983. They anticipate that the National Park Service will provide an additional 199 campsites and the remaining 271 will be provided by others (see Table 23).

Michigan Department of Natural Resources has projected recreation, for the northwest (Region 10) area, to 1990. They project about a 10% increase in boating, fishing, picnicing, and lake swimming (see Table 24).

TABLE 23
PROJECTED CAMPSITE REQUIREMENTS TO 1983
BENZIE COUNTY, MICHIGAN

Area	Existing (1972)	1983 Total Need	Balance Needed (1983)		
			Required	To Be Provided By:	
				NPS*	Others
National Lakeshore	386	695	309	199	110
Betsie River Chain	194	290	96	-	96
Platte River Chain	135	200	65	-	65
Benzie County Total	715	1,185	470	199	271

SOURCE: Comprehensive Development Plan, Benzie County Michigan,
Benzie County Planning Commission, Wilber Smith & Assoc., May, 1974

*: National Park Service

TABLE 24
RECREATION PARTICIPATION BY ACTIVITY
REGION 10

ACTIVITY	1972	1980	1990	PERCENT OF CHANGE	
				1972-80	1980-90
Picnicing					
Number Participant	199,000	219,000	242,000	10.4	10.5
Activity Days	2,376,000	2,608,000	2,875,000	9.8	10.2
Swim in Lakes					
No. Part.	257,000	283,000	306,000	10.1	8.1
Act. Days	6,251,000	6,874,000	7,357,000	10.0	7.0
Power Boating					
No. Part.	179,000	199,000	217,000	11.3	9.0
Act. Days	3,120,000	3,468,000	3,768,000	11.2	8.6
Other Boating					
No. Part.	71,000	79,000	86,000	12.1	9.1
Act. Days	1,129,000	1,267,000	1,381,000	12.3	9.0
Fishing					
No. Part.	197,000	218,000	238,000	10.3	9.4
Act. Days	4,011,000	4,442,000	4,839,000	10.8	8.9

SOURCE: Department of Natural Resources, State of Michigan Resource Reports,
Planning Region 10

ANALYSIS

INTRODUCTION

This section contains an economic analysis and open space assessment of the Data Base. Frankfort has many assets and some potential problems. They are discussed in this section.

1. Economic Analysis

Economic Base - The basic economic purpose of a community is often expressed as the "Economic Base". This is the main driving force of the local economy.

Lumber was the original economic base. Tourism was soon added. When the lumber industry declined, the economic base changed to general agriculture.

Today, the economic base is tourism agricultural processing, transportation, and manufacturing. Tourism and agricultural processing are not only seasonal, but very dependent on favorable weather. The transportation component is mainly dependent upon railroad and car ferry service. The loss (or temporary failure) of one or more of these components would have a serious effect on Frankfort's economy.

Future Economic Growth - The Kearney Study forecasts an 8% increase in cross-lake traffic (1985) under a "no-change" scenario. They also predict a 60% increase under the most favorable scenario, or a 50% decrease under the least favorable scenario. Presently there are several state actions pending which could affect these forecasts.

Regional forecasts of industrial growth are good. Growth in the manufacture of electrical machinery, equipment, and supplies; and textiles and textile products are anticipated. Frankfort's industrial growth will depend on its ability to compete in the region, and the on the national economy.

The exploration/production of oil and gas has been identified as a regional growth industry. The Frankfort-Elberta port may be in a desirable position to provide transportation and support services to this industry.

Tourism is forecasted to increase in the area due to national lakeshore. The National Park Service predicts that by 1985 park visitation will increase to about 83% of capacity or 3,195,000. A need for about 470 additional campsites in Benzie County has been identified.

Frankfort's tourism will depend on three factors:

- 1) Its draw from the National Lakeshore, especially day excursions and people coming/leaving the park.
- 2) Its ability to develop alternate recreational attractions (such as boating) and alternate seasonal attractions (such as winter sports.
- 3) The weather.

In our auto-dependent society, a community can be very dependent on its highway service. The main approach to the National Lakeshore is expected to be from the south along US31, which bypasses Frankfort. Thus communities such as Benzonia and Beulah will be in a good position (geographically) to attract tourists from the National Lakeshore. Frankfort, however, is not without its advantages in this respect. The car ferry provides a tourist stream from Wisconsin and points west, from which Frankfort can draw. In addition, M-22 can be promoted as the "scenic and educational" route. Frankfort's natural features (especially Lake Michigan and Betsie Lake) present an opportunity to develop a specialty shopping and dining atmosphere, which would not be available along US-31.

Economic Variables - As are most small communities, Frankfort's economy is related to the national economy. If it slumps, then so will Frankfort's.

Since agriculture and tourism are dependent on favorable weather conditions, important components of Frankfort's economy would be adversely affected by unfavorable weather. A prolonged period of poor weather would severely impact the tourist industry.

The elimination of car ferry and related railroad linkages would adversely affect Frankfort's unemployment picture, and isolate several regional industries. Elimination of the automobile and passenger cross-lake service would cut off a tourist stream upon which Frankfort's tourism is very dependent.

Infrastructure and Physical Implications - Of all the economic variables, infrastructure and physical development are most directly under local control. Frankfort can create opportunities for economic growth through the development of roads and utilities. Many communities, including Frankfort, have extended this concept by developing industrial parks. Communities can also encourage physical development (which in turn would produce economic growth) through various financing, regulatory approval, and management techniques. Tax abatements and economic development corporation bonds are among the most common.

On the Frankfort waterfront, the City Marina is a good example of these techniques. This marina, developed with public funds supports the tourist industry and many secondary economic components. Many similar opportunities, especially joint public-private, exist along the Frankfort waterfront.

2. Open Space Assessment

Available data and local input suggests that the open space and recreational needs of the local population, with respect to the coastal zone, are being met. There is excellent public access to Betsie Lake and good access to Lake Michigan.

Betsie Lake open space will increase when the U.S. Army Corps of Engineers confined disposal facility is finished. At that time, all the shoreline between 5th Street and 10th Street will be used for public recreation.

Much of the Betsie Lake shoreline is not in a natural state. The entire shoreline from the Coast Guard Station to (and including) Mineral Spring Park has been improved with man-made structures. Many of the soils in this area are fill and most of the lake bottom has been dredged. The area between Mineral Spring Park and the C.S. Kibbey Memorial Boat Launch is committed for the confined disposal facility. When it is constructed, the natural areas in this stretch will be filled and improved. Thus between the Coast Guard Station and the boat launch no environmental management areas exist.

Between 10th Street and Lake Street, is an industrial area. With the exception of a channel to the Luedtke construction yard, most of the shoreline is unimproved.